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ABSTRACT

The perceptual-developmental research of Kagan and Witkin elicited this study of cognitive style. The work of these two researchers leads to the conclusion that differences between graphic expressions of children of the same age reflect differences in the children's mode of information processing. Specifically, this study sought to test the following hypotheses: (1) the subjects' cognitive style, as measured by the Conceptual Style Test (CST), and his mode of perceiving as measured by the Children's Embedded Figures Test (CEFT), will correlate significantly with specific criteria of his graphic expressions, and (2) analytical scores on the CST, CEFT, and graphic expressions (Drawings I, II, and III and Sophistication of Body Concept) will increase as subjects advance in grade. Affirmation of the second hypothesis would indicate a developmental trend from a global (field-dependent) mode of information processing to an analytical (field-independent) mode. The tests were administered to 114 boys, two of each grade level, from grades 2 through 6. The results, obtained from testing of sub-hypotheses, indicate general support for the second hypothesis and partial support for the first. The specific data are discussed in relation to conceptual style, perceptual mode, and graphic expression. Specific recommendations for further study of cognitive styles are made. (Author/MH)

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THE RELATION OF CONCEPTUAL STYLES AND MODE OF PERCEPTION TO GRAPHIC EXPRESSION

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INTRODUCTION

Early research in cognition, perception and graphic expression attributes differences in the cognitive and graphic products of children of the same age to differences in the amount of knowledge, facility in reasoning, skills or biogenic determined developmental levels. More recent studies in cognition and perception seem to indicate stable intraindividual consistencies of patterning in coping with and relating verbal and visual information.[1 2]

In recent years a number of psychological tests have been developed and variables identified that are cognitive in nature but do not deal directly with intelligence. It was found that a certain aspect of mental functioning can be reliably measured and grouped together as measures of perceptual or cognitive style.[3 4 5 6] Some of the behaviors studied for defining and measuring these dimensions of style are as follows; the way in which an individual organizes an amorphous perceptual field; the manner in which he deploys his attention in scanning a stimulus; the extent to which he is analytical rather than global in his approach to categorizing familiar objects; and the degree to which he can overcome embedded or conflicting perceptual cues in coping with a specific problem.

The moxt extensive program in the field of perceptual style is the work by Herman Witkin and his colleagues.[7 8] Originally Witkin was concerned with the problem of bodily orientation to the vertical dimension using conflicting visual and kinesthetic cues. In an experimental situation using a tilted room and tilted chair, Witkin found that individuals vary from each other in the extent to which they were able to ignore the

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conflicting visual cues while adjusting to an upright position. Witkin used the terms field-dependent and field-independent to describe these observed modes of perception. Field-dependence is the inability to separate an item from the field or to overcome an embedding context. Field-independence is the ability to perceive objects apart from the context in which they occur, or to overcome an embedding context, or to deal with a field analytically. More recently, these modes of perceiving were designated as global (field-dependent) and analytical (field-independent).[9] A wide variety of perceptual and cognitive tasks as well as a number of personality characteristics seemed to correlate with field dependency. Results from a number of related tasks conducted by Witkin showed that an individual is consistent in his ability to make a correct judgment or to overcome the influence of an embedding context. Self-consistency in the subjects used for these studies was evident despite variations in many specific features of the tasks involved.

The experimental work of Jerome Kagan and his colleagues with cognitive style, like Witkin, indicates consistencies in coping with and relating information. Conceptual activities of children in two dimensions of categorization used to describe cognitive style, the analytical and relational or global were studied.[10] Kagan devised the Conceptual Style Test to identify consistencies of response to visually presented stimuli that were constructed to elicit these two major classes of responses: the analytical and the relational. The analytical child attends initially to details that may have a common characteristic. The relational or global child attends initially to the total stimulus--the relational or functional characteristics of objects.

Results from a number of studies conducted by Kagan, Moss and Sigel using a variety of visual, verbal and projective tests correlated

significantly with analytical conceptual style. Stylistic differences in sorting (Figure Sorting Test) were found in many of the same kinds of tasks that have been described as field-dependent and field-independent perceivers.[12] Analytic sorters were clearer and more exact in their description of Rorschach ink blocks and better able to describe their experiences of inner feelings in an interview stiuation than global sorters. These individuals were more active and more striving and less dependent.[13] Also, the behavioral correlates Kagan found characteristic of the analytical child are apparently similar to Witkin's analysis of his analytical dimension.

The research reviewed on cognitive style suggests the following implications: (1) that there is a pervasive self-consistency in cognitive and perceptual functioning; (2) that stability of cognitive style is evident through years of rapid growth and development; (3) that the categories describing cognitive styles are the global and analytical dimensions; and (4) that this cognitive dimension refers to the extent to which the individuals experience, both of himself and of the external environment tends to be relatively articulated (analytical) or relatively global.

The possibility of an individual performing in a self-consistent manner when processing visual and/or cognitive information into graphic expression has not been studied. Implications from the research on cognitive styles suggests the following postulate: that differences between the graphic expressions of children of the same age reflect differences in their modes of information processing. Thus it was expected that a significant correlation would be found between an individual's preference

for an analytical mode or global mode of experiencing in his drawings.

STATEMENT OF THE PROBLEM

It was the purpose of this study to investigate the possible relationship of the findings of Witkin on consistencies in mode of perceiving, and the findings of Kagan on consistencies in mode of cognition to the possible consistencies in the mode of graphic expression of boys at five grade levels.

The major assumptions on which this study is based are:

(1) An individual's preference for an analytical mode of perceiving is also evident in his preference for an analytical mode of conceptualizing.

(2) An individual's preference for a global mode of perceiving is also evident in his preference for a global mode of conceptualizing.

The inference drawn from these assumptions was: (1) an individual's preferred mode of information processing would be consistent across the domains of perception, cognition and graphic expression.

This study was limited to testing the following hypotheses:

General Hypothesis I: The subject's cognitive style, as measured by the Conceptual Style Test, and his mode of perceiving as measured by the Children's Embedded Figures Test will correlate significantly with specific criteria of his graphic expressions (Drawings I, II, III and Sophistication of Body Concept).

The General Hypothesis I was analyzed on the basis of the following specific hypotheses:

Hypothesis IA: The subject's cognitive style and mode of perceiving will be significantly correlated.

Hypothesis IB: The subject's cognitive style will correlate significantly with Drawings I, II and III.

Hypothesis IC: The subject's cognitive style will correlate significantly with the Sophistication of Body Concept.

Hypothesis ID: The subject's mode of perception will correlate significantly with Drawings I, II and III.

Hypothesis IE: The subject's mode of perception will correlate significantly with the Sophistication of Body Concept.

Hypothesis IF: The usbject's articulation of his body concept will correlate significantly with Drawings I, II and III.

General Hypothesis II: Analytical scores on the Conceptual Style Test, Children's Embedded Figures Test and graphic expressions (Drawings I, II, III and Sophistication of Body Concept) will increase as subjects advance in grade, revealing a developmental trend from initially global processing of information to a more differential or analytical mode.

The General Hypothesis II was analyzed on the basis of the following specific hypotheses:

Hypothesis IIA: The means of the total scores on Drawings I, II and III will increase as subjects advance in grade.

Hypothesis IIB: The means of the total scores on the Sophistication of Body Concept Test will increase as subjects advance in grade.

Hypothesis IIC: The means of the total scores on the Conceptual Styles Test will increase as subjects advance in grade.

Hypothesis IID: The means of the total scores on the Children's Embedded Figures Test will increase as subjects advance in grade.

RESEARCH PROCEDURES

One hundred and fourteen boys from ten classes, two of each grade level from grades two through six participated in the study. The students

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attended Moffitt Elementary School in Springfield, Oregon. Springfield, with a population of approximately 26,000 is adjacent to Eugene, a university city of approximately 76,000.

In contrast to Eugene, a cultural and educational center, Springfield is primarily an industrial blue-collar city whose economy is based on the lumber industry. However, Springfield is greatly influenced by the university through experimental programs operating in the public schools and by the availability of university classes for the teachers and general population.

Moffitt Elementary School, at the time of this study, had a student enrollment of 508 in grades one through six. The mean number of students in a class (nineteen classrooms) was 26.7. Children are grouped heterogeneously--the only determinants in placing incoming students are age, grade and availability of space. Approximately twenty percent of the children come from families that are on welfare or that qualify for poverty programs. A minimum percentage of children have parents in professional fields, in business, or executive positions.

The following procedures were used in testing the hypothesis:

1. Age and I.Q. scores were obtained from school records. All subjects participating in the study had been given the short form of the California Test of Mental Maturity.

2. The testing procedure involved both group and individual administrating of tests over a two-month period of time. The Sophistication of Body Concept Test, Drawings I, II and III were given to intact classes

in a group situation. The Children's Embedded Figures Test and the Conceptual Style Test were administered to subjects on an individual basis by the author and a graduate student in art education.

3. Drawings I, II and III were coded and then rated by two independent judges on the basis of a rating scale designed by the author. The percentages on inter-rater agreement were consistently high.

4. The Sophistication of Body Concept Test was rated by two independent judges on a rating scale designated for the test. The percentage on inter-rater agreement was satisfactory.

5. No subject or group of subjects were involved with more than one testing session per day. To avoid practice effects on drawing of the human figure the Sophistication of Body Concept Test preceded the visually presented stimuli for Drawings I, II, and III.

Tests Used to Measure the Dependent Variables:

Conceptual Style Test--The Conceptual Style Test (CST) was developed by Kagan to study inver-individual differences of children in the processing of information in relation to the analytic versus nonanalytical categorizations. Basic to the premise is the tendency of children and adults to have a hierarchial preference with respect to the stimulus characteristics they will initially attend to in a situation where the individual has freedom of choice.

The CST consists of a set of nineteen stimuli: each with three black-white drawings of familiar objects. The subject is to "pick out two pictures that are alike or go together in some way." These stimuli have been constructed to elicit two major classes of responses--analytic and relational concepts. Another type of responses, the inferential-categorical, is possible to a lesser degree.

Children's Embedded Figures Test (CEFT)--The ability to overcome an embedding context was found to be central to the field dependence dimension by Witkin, Dyke, Faterson, Goodenough and Karp in their extensive research on psychological differentiation. Further studies revealed that field-dependence-independence was not an adequate label to encompass other related observed behaviors. The terms analytical (field-independence) and global (field-dependence) were adopted to describe the perceptual component of a general cognitive style. Karp and Konstadt assisted by Goodenough and Witkin developed the CEFT for testing the global--analytic dimension of children.

The CEFT includes twenty-five test items, each involving the location of a simple figure (tent, house) that is embedded within a complex realistic picture (boat, train).

Sophistication of Body Concept (SBC)--Evidence from studies conducted by Witkin and his colleagues[14] suggest that there is a similarity in a child's manner of experiencing himself and the world around him. From these observations, the following hypothesis was developed: children with an analytical field approach would tend to have a more articulated body concept than children with a global approach.

The Sophistication of Body Concept Scale was designed by Marlens to reflect the degree of primitivity or sophistication of children's drawings of the human figure. This scale involves a single rating based on a number of specific criteria. The criteria are based on directly observable characteristics of the figures rather than on the usual projective interpretations of drawings.

The SBC was used in this study as another measure of the global-analytic dimension in the graphic expression of children. Since no visual stimuli is presented in administering the SBC, the drawing of a figure is the child's conceptual interpretation, an abstraction constructed from his experience as a result of interacting with his environment. This drawing response differs from the three drawing tests introducted by the author to elicit the child's perceptual interpretation of visually presented stimuli.

Drawing Tests--Three drawing tests developed by the author were used in the study to compare the analytic-global graphic responses of children to their conceptual (CST and SBC) and perceptual (CEFT) responses of the same dimensions. The visual stimuli consisted of three black and white 35 mm. slides of subject matter familiar to most children. A slide of a close-up view of the entrance to Moffitt Elementary School, familiar to the subjects, was used as the visual stimuli for Drawing I (Figure I). For Drawing II, a slide of a grouping of toys was used as the visual stimulus (Figure 2). A child holding a toy truck and seated on outdoor stairs with a portion of a house in the immediate background was the subject matter for the slide used in Drawing III (Figure 3). Slides rather than real objects were used in order to eliminate many points of view possible in a classroom situation where children necessarily see different points of views of objects by virtue of their seating arrangement.

The selection of objects and subject matter of defined and somewhat varied size, space and figure-ground relationships was an important consideration for the evaluation of global and analytical responses in graphic expression. The rationale developed by the author and used to

evaluate drawings on a global-analytical continuum was based on the extensive research conducted by Witkin and Kagan. Space, size and figure-ground relationships are variables noted by both investigators that appear to elicit different kinds of responses from the global and analytical person.

Five categories, each of which contained five criteria describing drawing responses on a global-analytic continuum were used for this evaluation process. The categories selected were size relationships, value relationships, detail relationships, space relationships, and figure-ground relationships (Figure 4). The subject received a score for each category based on the numerical value assigned to each criterion within the category. A total score for individual drawings was obtained by adding the scores from all of the categories. Correlations of each category to the total scores of Drawings I, II and three are presented in Table I.

Summary of the Findings

The General Hypothesis I was analyzed on the basis of five specific hypothesis derived from the General Hypothesis. For every specific hypothesis, coefficients of correlations were obtained for the total group and for each grade level.

Hypothesis IA: Scores from the CST and CEFT correlated to test Hypothesis IA.

Coefficients of correlation for the CST and CEFT for the total group and for grades two, three, five, and six were low or nonsignficant. The correlation was significant for grade four Hypothesis IA was rejected for the total group and for grades two, three, five and six. The hypothesis was accepted for grade four.

Hypothesis IB: Scores from the CST and the total scores from Drawings I, II and III were used to test Hypothesis IB.

Hypothesis IB was rejected for the total group and for grades five and six. Correlations for these groups were low or nonsignificant. Significant correlations were obtained for grade two on Drawings I and II; for grade three on Drawing III; for grade four on Drawing III. Since the resulting data were ambiguous, Hypothesis IB was neither confirmed nor rejected for grades two, three and four. The hypothesis remains open for further investigation.

Hypothesis IC: Scores from the CST and SBC were correlated to test Hypothesis IC.

Correlations between the CST and the SBC were low or nonsignificant for the total group and for grades two, three, five and six. The hypothesis was rejected for these groups. A significant correlation was obtained at grade four, therefore, the hypothesis was accepted at this level.

Hypothesis ID: To test Hypothesis ID, scores from the CEFT and total scores from Drawings I, II and III were used.

Correlations between the CEFT and Drawings I, II and III were significant for the total group and for grades two and four. Significant correlations were yielded for grade six on Drawings I and III. The hypothesis was accepted for those groups. The hypothesis was rejected for grades three and five on the basis of low or nonsignificant correlations.

Hypothesis IE: Scores from the CEFT and the SBC were used to test Hypothesis IE.

Significant correlations were yielded for the total group and for grades two and four. The hypothesis was accepted for these groups. For grades three, five and six, the hypothesis was rejected on the basis of low or nonsignificant correlations.

Hypothesis IF: To test Hypothesis If, scores from the SBC and Drawings I, II and III were used.

Correlations between the SBC and Drawings I, II and III were significant for the total group and for grades two, three and six; and for grade four on Drawings I and III. A trend toward significance was indicated for grade four on Drawing II with a .10 level of significance. Hypothesis IF was accepted for the total group and for grades two, three, four and six. The hypothesis was rejected for grade five.

The results of each specific hypothesis derived from the General Hypothesis I are indicated in Table 8.

The General Hypothesis II was analyzed on the basis of four specific hypotheses derived from the General Hypothesis. The means of scores of each measure according to grade level were compared to test these hypotheses. The analysis of variance was also used to indicate differences between means. Developmental trends are indicated for each hypothesis in Graphs I through IV. Significant differences between means are shown in Tables 9 through 12.

Hypothesis IIA: To test Hypothesis IIA, total scores on Drawings I, II and III were divided according to grade level and the means for each group were compared.

Except for a slight decline in means from grades two to three and four to five on Drawing II, the general increase of means on the three drawings indicated a developmental trend. The hypothesis was accepted. Significant differences between means on all three drawings occurred between four grade level comparisons: grades two and five, two and six, three and six. Significant F-ratios were also yielded between grades three and five on Drawings II and III, and between grades three and four

on Drawing II. All significant differences were in the direction of the intermediate grade level.

Hypothesis IIB: To test Hypothesis IIB, the means of the total scores from the SBC were divided according to grade levels and comparisons were made between grades for indications of a developmental trend.

The increased means on the SBC at each successive grade level indicated a developmental trend. The hypothesis was accepted. Significant F-ratios were obtained in five out of ten grade comparisons, all of which were in the direction of the intermediate grade.

Hypothesis IIC: The means of the total scores on the CST were divided according to grade levels and compared. The results indicated a decrease of analytical responses. Except for grade three, the means on the CST decreased as subjects' advanced in grade. Hypothesis IIC was rejected.

Hypothesis IID: The means of the total scores on the CEFT for each grade level were used to determine developmental trends. With the exception of grade four, the means for all other grade levels increased as subjects advanced in grade. Hypothesis IID was accepted.

Significant differences between means were indicated for grade comparisons two and six, four and six in the direction of the higher grade level.

CONCLUSIONS

The Conceptual Style Test, used as a measure of cognitive style, yielded less significant correlation than any other measure used in the study. Possible factors contributing to these results remain speculative and indicate that further research based on the CST is necessary. With the exception of the CST all other measures used in the study were based on reflectivity. Initial responses to the CST were recorded, indicating

that a more impulsive reaction occurred. Research findings on reflective--impulsive responses seem to indicate that reflection is related to the analytical dimension. The nature of the testing procedure specified for the CST may have encouraged impulsive behavior resulting in greater global responses.

A relationship, indicating consistency, appears to exist between conceptual style, perceptual mode and graphic expression the analytic-global dimension for particular grade levels within some measures. For grade levels with significant correlations, the task involving conceptualizing (CST) appeared to be related in the global-analytic dimension to the tasks involving perception--overcoming an embedded context (CEFT), and drawings based on perceiving (Drawings I, II, III0 and conceptualizing (SBC).

Significant correlations between the CEFT and measures of graphic expression for the total group and for grade levels, indicated that the scores appeared to be consistent across tests in the global or analytic dimension. For groups yielding significant correlations, the task of overcoming an embedded context (CEFT) seemed to be related in the analytic-global dimension to the task involving drawings based on perceiving visual stimuli (Drawings I, II, III0 and conceptualizing (SBC). The magnitude of the correlation between the CEFT and the SBC for the total group suggests considerable correspondence between modes of field approach and extent of articulation of body concept.

Significant correlations between the SBC and Drawings I, II and III suggest that the scores were consistent across tests in the analytic-global dimension. For groups yielding significant correlations, the task of conceptualizing one's body concept in graphic form (SBC) appeared to be related to the task involving drawings based on perceiving visual

stimuli (Drawings I, II and III).

A developmental trend from an initial global processing of information to a more differentiated or analytical mode as subjects advanced in grade occurred for the following measures: Drawings I, II and III, the SBC and the CEFT. Scores from these measures increased as subjects advanced in grade.

The results from the CST indicated a decrease of analytical responses. Except for grade three, scores on the CST decreased as subjects advanced in grade.

The data also indicated that the range of individual differences in scores for all measures was greater within, rather than between grade levels.

Scores on all the measures for a given individual were somewhat consistent in the tendency to be global or analytical but showed some variation from task to task. These individual differences may be due to the nature of the task and to the influence of unknown variables, such as the effect of the classroom teacher, prior training in the task, involvement in the task and constitutional disposition.

Differences in the graphic expressions of children of the same age appeared to reflect differences in their modes of information processing. Implied in the resulting data is that, for the total group and for most grade levels studied, an individual's preference for an analytical mode or global mode of experiencing seems to be evident in his drawings.

Implications from research on perceptual development suggest that consideration of individual differences in mode of field approach as reflected in psychological functioning is of utmost importance in educational decisions. Development of curriculum and criteria for

for evaluation would need to encompass and allow for differences in products children produce and other types of behavior based on their cognitive style and psychological differentiation. How children perceive and process information would be evident in how and what they choose to express in their art work. Children who are more analytical in their approach would be able to overcome embedding contexts, include more details and perceive parts in relation to the whole in the stimuli presented for art work. Children who are more global would tend to see the stimuli as a whole, be less able to detect an embedded context and would tend to use less details in their work.

RECOMMENDATIONS FOR FURTHER STUDY

Although extensive research has been conducted on cognitive styles pertaining to the perceptual and conceptual modes of processing information in the global and analytical dimension, the author knows of no other study relating cognitive styles to graphic expression based on perceiving visual stimuli. On the basis of her experience in this study, the writer makes the following recommendations for further research:

1. Further investigation of the nineteen triad form of the CST for reliability and validity and its use on a developmental basis and for possible intercorrelations with perceptual and drawing tasks.

2. Investigate the affects of reaction time of the various tasks used in the study. It seems plausible that performance on tasks are related to a reflective or impulsive attitude.

3. Identify the intervening variables within each grade level that may influence the quality of performance as a result of performance as a result of unusual circumstances. To check the similarity of groups

used in the study, means on the I.Q. was compared. A significant difference occurred for grade five. Further investigation revealed other differences that may have affected the results on tasks obtained for grade five. For the school year 1968-69, more boys from grade five were referred to the counselor than any other age or sex group in the school. There were also more referrals for remedial reading from grade five than any other grade. Achievement scores were generally lower for grade five than for any other grade. The affect of these variables on the performance of fifth grade boys used in the study remains to be investigated to see if this is developmental or a factor of this particular sample.

4. Compare the assumptions made by current child art theories and the implications made for the assessment of individual art production. The wide ranges of scores within each grade level on the tasks used in this study indicated that children of the same grade level project various levels of development due to individual differences in experiencing and in the processing of information. Differences in the graphic expression of children of the same age appeared to be related to preferred mode of perception and, to some extent, cognition. A reevaluation of the bases used for assessing children's art work is a relevant area for further research.

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Figures 1, 2, and 3, Visual Stimulus for Drawing, photographs have been omited from this copy due to poor photo-reproduction.

Figure 4

CRITERIA USED BY JUDGES FOR RATING DRAWINGS I, II AND III ON AN ANALYTIC-GLOBAL CONTINUUM

Groupings

A. Size Relationships:

Global

1. No evidence of size relations.
2. Observable attempt to differentiated size relationships. A few objects (about twenty-five per cent) showing size relationships. About one half of the objects drawn in relation to the sizes of other objects.
4. Observable differentiated size relationships. Most objects drawn in relation to the sizes of other objects.

Analytical

5. Definite observable differentiated size relationships. All or nearly all objects drawn in relation to the sizes of other objects.

B. Value Relationships:

Global

1. Undifferentiated dark and light values.
2. Observable use of dark and light values to differentiate values.
3. Some observable use of dark and light values to differentiated objects. About one-half of the objects

drawn correspond in value to the stimuli presented.

4. Observable use of dark and light values to differentiate objects. Most objects drawn correspond in value to the stimuli presented.

Analytical 5. Definite observable use of dark and light values to differentiated all or nearly all objects. Values used correspond closely to the stimuli presented.

C. Detail Relationships:

Global 1. Minimal use of details; emphasis on the whole configuration rather than the parts of the object and their details.

2. Observable use of detail and the relating of the parts to the whole drawing, however, they are barely discernible.

3. Some use of detail and the relating of the parts to the whole drawing. About one-half of the objects drawn show differentiation by use of details within the object; parts of the objects related to the whole object; and, objects related to the total stimulus presented.

4. Most of the drawing shows the use of details and the relating of the

parts to the whole drawing. Most objects differentiated by the use of details within the object, most parts of the object related to the whole object; and, most objects are related to the total stimulus presented.

Analytical 5. Observable use of detail and the relating of the parts to the whole drawing. Differentiation of each object by the use of details for clarification; parts of the object related to the whole object; and each object related to the total stimuli presented.

D. Space Relationships:

Global 1. No evidence of spatial relationships.

2. Observable attempt to differentiate spatial relationships. A few objects (about twenty-five per cent) showing spatial relationships.

3. Some observable differentiation in the placement of objects in their contained space. About half of the objects drawn in relation to other objects in their respective spatial positions.

4. Observable differentiated space relationships. Most objects drawn in relation to other objects in their

respective spatial positions.

Analytical 5. Observable differentiation in the placement of objects in their contained space. All or nearly all of the objects drawn in relationship to other objects in their respective spatial position.

E. Figure-Ground Relationships:

Global 1. No observable differentiation between figure and ground.

2. Observable differentiation between figure and ground. A few objects (about twenty-five per cent) are differentiated from the space surrounding the object.

3. Some observable differentiation between figure and ground. About one-half of the objects drawn are differentiated from the space surrounding the object.

4. Observable differentiation between figure and ground. Most objects drawn are differentiated from the space surrounding the object.

Analytical 5. Definite observable differentiation between the figure and the ground. All or nearly all objects drawn are differentiated from the space surrounding the object.

System of Rating and Scoring

1. Each student received a score for each category. Each drawing was rated on every criterion.

2. Correlations of the three drawings of an individual child on each category (A, B, C, D, E) were computed.

3. Correlations for each drawing between grades as well as within grades were computed.

Scoring Code Interpretation

A 1	Global	A-Size Relationship
A 2		
A 3	to	
A 4		
A 5	Analytical	

The higher the score, the greater the tendency of the child to interpret this type of visual information in an analytical mode.

The lower the score, the greater the tendency of the child to interpret this type of visual information in a global mode.

TABLE 1

COEFFICIENTS OF CORRELATIONS OF EACH CATEGORY TO TOTAL SCORE BY DRAWINGS*

Drawings	A: Size	B: Value	C: Detail	D: Space	E: Figure-Ground
I	.879	.435	.877	.861	.880
II	.893	.647	.924	.903	.887
III	.817	.515	.873	.877	.863

* All correlations are significant at .001.

TABLE 2

HYPOTHESIS IA: COEFFICIENTS OF CORRELATION BETWEEN THE CST AND CEFT BY TOTAL GROUP AND BY GRADE LEVELS

Total Group: N = 114	Grade 2: N = 24	Grade 3: N = 22	Grade 4: N = 19	Grade 5: N = 25	Grade 6: N = 24
.099*	.135*	.257*	.563**	-.036*	-.023*

Levels of significance: * = NS; ** = .02.

TABLE 3

HYPOTHESIS IB: COEFFICIENTS OF CORRELATION BETWEEN THE CST AND DRAWINGS I, II AND III FOR THE TOTAL GROUP AND GRADE LEVELS

	Total Group	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
DR. I	.099*	.363**	.276*	.243*	-.039*	.214*
DR. II	.115*	.379**	.030*	.365*	.036*	.245*
DR. III	.132*	.330*	.407**	.573***	.201*	.074*

Levels of significance: * = NS; ** = .10; *** = .02.

TABLE 4

HYPOTHESIS IC: COEFFICIENTS OF CORRELATION BETWEEN THE CST AND SBC FOR TOTAL GROUP AND FOR GRADE LEVELS

Total Group	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
.039*	.214*	.091*	.461**	.066*	.039*

Levels of significance: * = NS; ** =.05.

TABLE 5

HYPOTHESIS ID: COEFFICIENTS OF CORRELATION BETWEEN THE CEFT AND DRAWINGS I, II, III FOR TOTAL GROUP AND GRADE LEVELS

Drawings	Total Group	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
I	.491****	.630****	.297[x]	.494**	.327[x]	.496***
II	.397****	.644****	-.011[x]	.529***	.191[x]	.324[x]
III	.471****	.627***	.239[x]	.451*	.164[x]	.542***

Levels of significance: x=NS; * =.10; ** =.05; *** =.02 to .01; **** =.001.

TABLE 6

HYPOTHESIS IE: COEFFICIENTS OF CORRELATION BETWEEN THE CEFT AND SBC FOR THE TOTAL GROUP AND FOR GRADE LEVELS

Total Group	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
.351***	.491**	.203[x]	.395*	.124[x]	.247[x]

Levels of significance: x NS; * = .10; ** =.02; *** =.001.

TABLE 7

HYPOTHESIS IF: COEFFICIENTS OF CORRELATION BETWEEN THE SBC AND DRAWINGS I, II, III FOR TOTAL GROUP AND GRADE LEVELS

Drawings	Total Group	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
I	.511****	.479***	.461**	.555***	-.035[x]	.509***
II	.540****	.661****	.575***	.451*	.184[x]	.419**
III	.626****	.605***	.744****	.639***	.277[x]	.520***

Levels of significance: x=NS; * =.10; ** =.05; *** =.02 to .01; **** =.001.

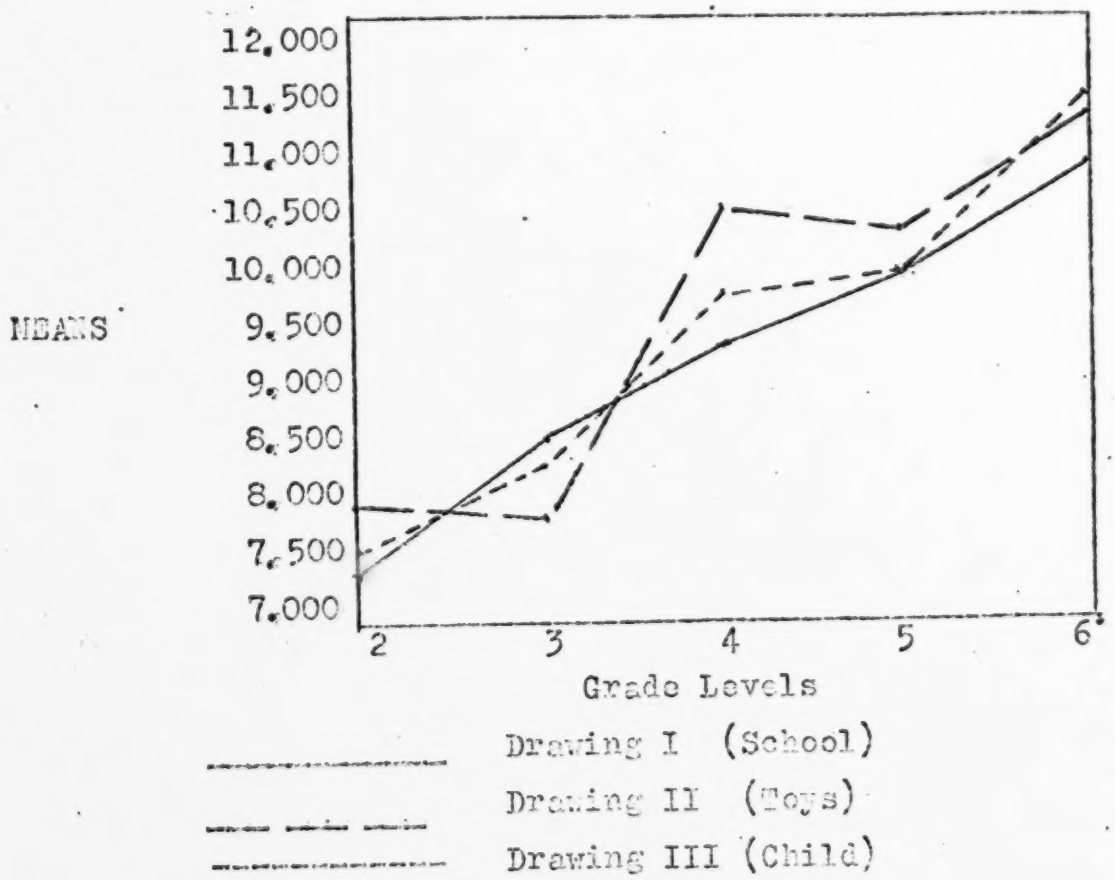
TABLE 8

LEVELS OF SIGNIFICANCE OBTAINED OF CORRELATIONS FROM SPECIFIC HYPOTHESES OF GENERAL HYPOTHESIS I

Hypothesis	Total Group	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
IA: CST-CEFT	NS	NS	NS	.02	NS	NS
IB: CST: DR. I	NS	.10	NS	NS	NS	NS
DR. II	NS	.10	NS	NS	NS	NS
DR. III	NS	NS	.10	.02	NS	NS
IC: CST-SBC	NS	NS	NS	.02	NS	NS
ID: CEFT:DR. I	.001	.001	NS	.05	NS	.02
DR. II	.001	.001	NS	.02	NS	NS
DR. III	.001	.001	NS	.10	NS	.01
IE: CEFT-SBC	.001	.02	NS	.10	NS	NS
IF: SBC: DR. I	.001	.02	.05	.02	NS	.02
DR. II	.001	.001	.01	.10	NS	.05
DR. III	.001	.01	.001	.01	NS	.01

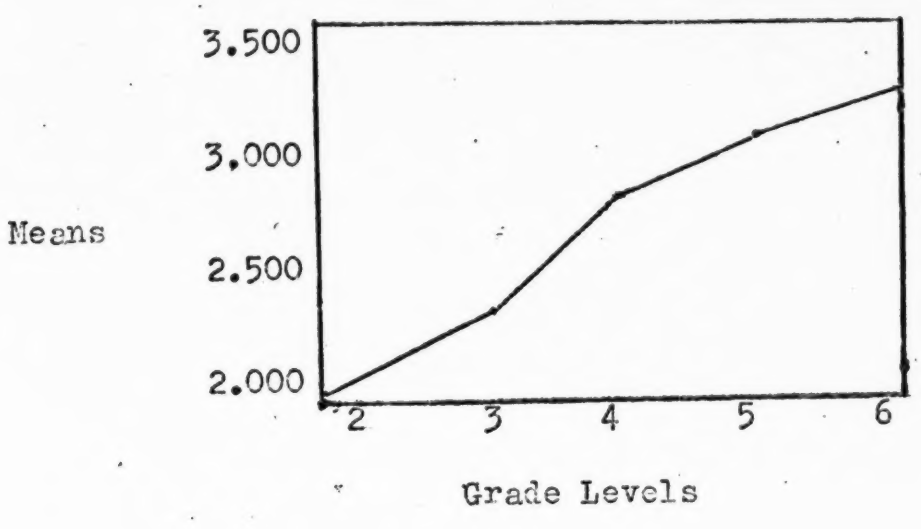
GRAPH I

MEANS ON DRAWINGS I, II, III FOR GRADE LEVELS



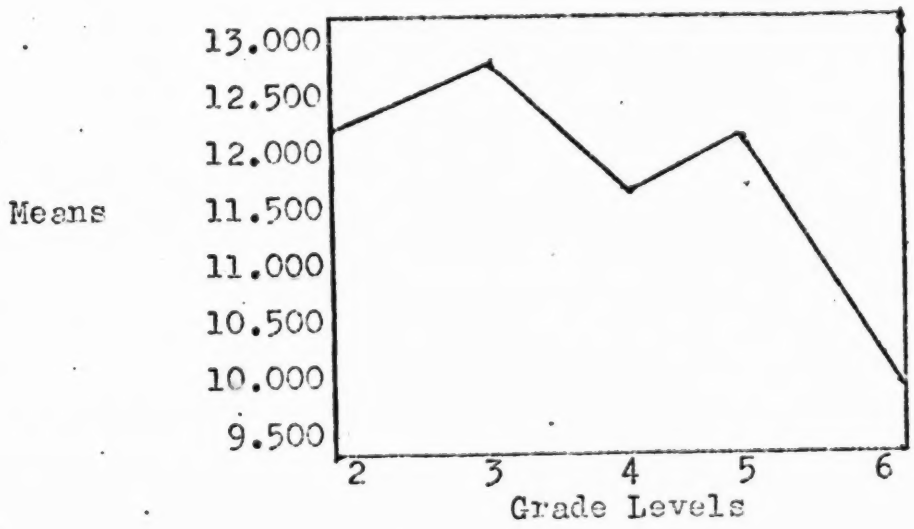
GRAPH II

MEANS ON THE SBC FOR GRADE LEVELS



GRAPH III

MEANS ON THE CST FOR GRADE LEVELS



Graph IV

MEANS ON THE CEFT FOR GRADE LEVELS

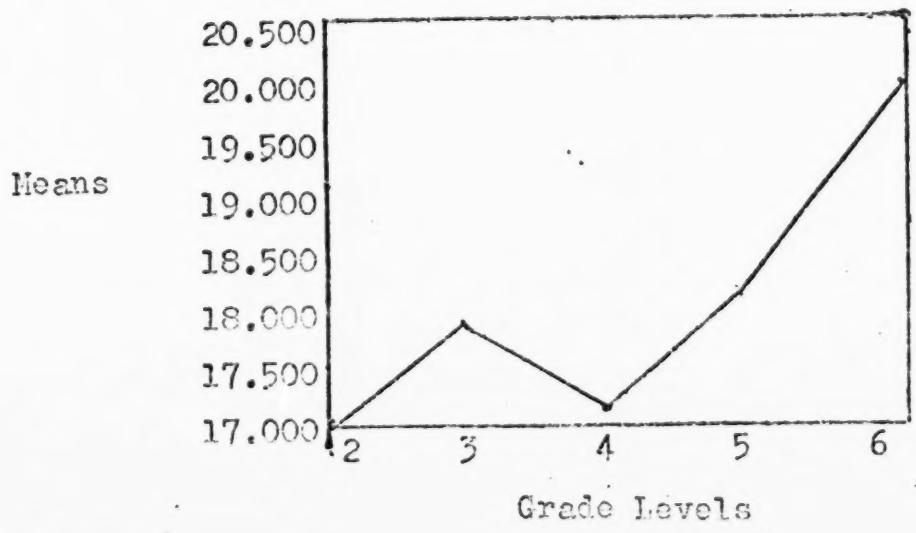


TABLE 9

F-RATIOS YIELDING .05 LEVEL OF SIGNIFICANCE*
DRAWINGS I, II, III

Grades	2 4	2 5	2 6	3 4	3 5	3 6
DR I	6.208	9.151	10.882			7.590
DR II	8.187	9.150	10.483	10.011	10.848	11.370
DR III	7.847	10.386	22.563		4.129	13.387

F of 4.08 is significant at .05 with 40/1 d.f.
*One-way analysis of variance.

TABLE 10

F-RATIOS YIELDING .05 LEVELOF SIGNIFICANCE* ON THE SBC

Grades	2 4	2 5	2 6	3 5	3 6
	11.702	30.537	21.233	10.354	7.816

F of 4.08 is significant at .05 with 40/1 d.f.
*One-way analysis of variance.

TABLE 11

F-RATIOS YIELDING .05 LEVEL OF SIGNIFICANCE* ON THE CST

Grade 3	Grade 6
5.246	

Grade 5	Grade 6
4.371	

F of 4.08 is significant at .05 with 40/1 d.f.
*One-way analysis of variance.

TABLE 12

F-RATIOS YIELDING .05 LEVEL OF SIGNIFICANCE* ON THE CEFT

Grade 2	Grade 6
	6.716

Grade 4	Grade 6
	4.373

F of 4.08 is significant at .05 with 40/1 d.f.